

BAKHMETOVA, P. N.

BAKHMETOVA, P. N. -- "Streptomycin Therapy of Tuberculous Meningitis in Children." Donetsk State Medical Inst named S. M. Kirov. Donetsk, 1977. (Dissertation for the Degree of Candidate in Medical Sciences)

SC: Zhurnal, No 2, 1966

MINYAYEV, N.A.; RAZZHIVINA, Ye.Ya.

Valeriana sambucifolia Mik. f. in Leningrad Province. Vest. LGU
19 no.3:181-184 '64. (MIRA 17:3)

RAZZORENOV, F.F.

Calculating winter streamflow in the lower pools of hydro-
electric stations. Meteor. i gidrol. no.12:40-44 D '65.
(MIRA 18:11)

1. Vsesoyuznyy ordena Lenina proyektno-izyskatel'skiy i
nauchno-issledovatel'skiy institut im. Z.Ya. Zhuka.

GOTLIB, Ya.I., inzh.; KRAPIVIN, I.V., inzh.; RAZZORENOV, F.F., inzh.; ROZHKOV,
N.P., inzh.

Ice flow through the piers of the Bratsk hydroelectric power
station spillway dam. Gidr.stroi. 31 no.6:27-31 Je '61.

(MIRA 14:6)

(Bratsk Hydroelectric Power Station--Ice on rivers, lakes, etc.)

GOTLIB, Ya.L., inzh.; KRAPIVIN, I.V., inzh.; RAZFORENOV, F.F., inzh.;
SMOLIN, N.I., inzh.

Passage of frazil ice over the crest of the spillway dam of the
Bratsk Hydroelectric Power Station. Gidr. i stroi. 30 no.5:34-37
My '60. (MIRA 14:5)

(Bratsk Hydroelectric Power Station)
(Angara River--Ice)

SVETITSKIY, V.P.; PILOSOV, E.M.; ROZHKOV, N.P.; GOTLIB, Ya. L.;
MALKOV, A.B.; MAYEVSKIY, I.S.; RAZZORENOV, F.F.

Winter levels of the Amu Darya River in connection with
the design of the Nurek Hydroelectric Power Station.
Izv. AN Uz.SSR.Ser.tekh.nauk no.3:45-58 '61. (MIRA 14:6)

1. Institut vodnykh problem i gidrotekhniki AN UzSSR.
(Nurek Hydroelectric Power Station)

KHARSHAN, Sh.A.; GOTLIB, Ya.L.; RAZZORENOV, F.F.

Hydrometeorological service during the damming of the Angara River
at the construction site of the Bratsk Hydroelectric Power
Station. Meteor.i gidrol. no.7:37-40 J1 '60. (MIRA 13:7)
(Bratsk Hydroelectric Power Station region--Hydrology)

VASILISKO, I.A.; GOTLIB, Ya.L.; RAZZORENOV, F.F.; SMOLIN, N.I.

Practical instructions for the study of ice jams. Meteor. i
gidrol. no.2:55-57 F '56. (MLRA 9:6)
(Ice on rivers, lakes, etc.)

PAZZORENOV F.F.
PANFILOV, D.P.; PAZZORENOV, F.F.

Sludge. Meteor. i gidrol. no. 5:43-44 My '53. (MLRA 8:9)

1. Gor'kovskoye UGMS, Volzhskaya ekspeditaiya, Mosgidsp.
(Ice on rivers, lakes, etc.)

RAZVUBENOV, P.S.

Calculation of discharges in rivers in the autumn period. Meteor.
Iglarol. no. 9:6-95 3 '85. (MIRA 18:8)

1. Vsesoyuznyy ordena Lenin proyektno-izyskatel'skiy i nauchno-
issledovatel'skiy institut imeni S.Ya.Zhuka.

GOTLIB, Yakov L'vovich; ZAYMIN, Yevgeniy Yevgen'yevich; RAZZORENOV,
Fedor Fedorovich; TSEYTLIN, Boris Semenovich; CHEPELKINA,
L.A., red.

[Thermal properties of ice on the Angara River] Ledotermika
Angary. [By] IA.L.Gotlib i dr. Leningrad, Gidrometeoizdat,
1964. 196 p. (MIRA 17:6)

KOWALSKI, Tadeusz, inz.; SLOMIANKO, Pawel, doc. dr inz.; PASZKIEWICZ, Czeslaw, mgr; KARWOWSKI, Jozef, doc. dr inz.; DRUET, Czeslaw, dr inz.; TUBIELEWICZ-WITKOWSKA, Hanna, mgr inz.; SZARANIEC, Tadeusz, mgr inz.; ONOSZKO, Jerzy, mgr inz.; RBYNSKI, Jerzy, mgr inz.; HOFFMANN, Marian, mgr inz.

Discussions on papers and communications. Rozpr hydrotechn no.12: 119-127 '62.

1. Research Institute of Hydraulic Engineering, Polish Academy of Sciences, Gdansk (for all except Kowalski and Paszkiewicz).
2. Maritime Institute, Gdansk (for Kowalski).
3. State Hydrological and Meteorological Institute, Gdynia (for Paszkiewicz).

801/85
629.07
.15

Stills (TIFs, by) V. Perleba, Z. Kordiani, I L. Penevishvili. Moscow,
Inst-76 Arkhitektury i Grafostraitel'Stva, 1991.
91 P. Illus. (Arkhitektura: Goreda 31-8)
"Literatura".: P. 85.

PROCESSES AND PROPERTIES INDEX

ca

24

The transmission of detonations from one explosion-initiating substance to another. II. Dependence of the probability of transmission of detonation on the distance between the charges and from the passive charge. A. F. Belyaev, E. Rduktovskaya, and Yu. B. Khariton. *J. Appl. Theoret. Phys.* (U. S. S. R.) 7, 194-7 (1957); *ibid.* 8, 753-4. — For PbN₃ (azide) a study of the probability of explosion as a function of distance and position in the evacuated tube-vessel indicates that explosion of the second charge is due to an unequal scattering throughout the whole tube of the particles from the first detonation. III. Dimensions of the particles transmitting the detonation. A. F. Belyaev and Yu. B. Khariton. *Ibid.* 199-202. — A single crystal of Pb(N₃)₂ of wt. 1.7 mg. on explosion yields 4.10³ active explosion-producing particles with diams. of 10⁻⁴ cm. and a mass of 10⁻¹¹ grams.

P. H. Rathmann

ASB-3LA METALLURGICAL LITERATURE CLASSIFICATION

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45																									
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z AA AB AC AD AE AF AG AH AI AJ AK AL AM AN AO AP AQ AR AS AT AU AV AW AX AY AZ BA BB BC BD BE BF BG BH BI BJ BK BL BM BN BO BP BQ BR BS BT BU BV BW BX BY BZ CA CB CC CD CE CF CG CH CI CJ CK CL CM CN CO CP CQ CR CS CT CU CV CW CX CY CZ DA DB DC DD DE DF DG DH DI DJ DK DL DM DN DO DP DQ DR DS DT DU DV DW DX DY DZ EA EB EC ED EE EF EG EH EI EJ EK EL EM EN EO EP EQ ER ES ET EU EV EW EX EY EZ FA FB FC FD FE FF FG FH FI FJ FK FL FM FN FO FP FQ FR FS FT FU FV FW FX FY FZ GA GB GC GD GE GF GG GH GI GJ GK GL GM GN GO GP GQ GR GS GT GU GV GW GX GY GZ HA HB HC HD HE HF HG HH HI HJ HK HL HM HN HO HP HQ HR HS HT HU HV HW HX HY HZ IA IB IC ID IE IF IG IH II IJ IK IL IM IN IO IP IQ IR IS IT IU IV IW IX IY IZ JA JB JC JD JE JF JG JH JI JJ JK JL JM JN JO JP JQ JR JS JT JU JV JW JX JY JZ KA KB KC KD KE KF KG KH KI KJ KL KM KN KO KP KQ KR KS KT KU KV KW KX KY KZ LA LB LC LD LE LF LG LH LI LJ LK LL LM LN LO LP LQ LR LS LT LU LV LW LX LY LZ MA MB MC MD ME MF MG MH MI MJ MK ML MN MO MP MQ MR MS MT MU MV MW MX MY MZ NA NB NC ND NE NF NG NH NI NJ NK NL NO NP NQ NR NS NT NU NV NW NX NY NZ OA OB OC OD OE OF OG OH OI OJ OK OL OM ON OO OP OQ OR OS OT OU OV OW OX OY OZ PA PB PC PD PE PF PG PH PI PJ PK PL PM PN PO PP PQ PR PS PT PU PV PW PX PY PZ QA QB QC QD QE QF QG QH QI QJ QK QL QM QN QO QQ QR QS QT QU QV QW QX QY QZ RA RB RC RD RE RF RG RH RI RJ RK RL RM RN RO RP RQ RR RS RT RU RV RW RX RY RZ SA SB SC SD SE SF SG SH SI SJ SK SL SM SN SO SP SQ SR SS ST SU SV SW SX SY SZ TA TB TC TD TE TF TG TH TI TJ TK TL TM TN TO TP TQ TR TS TT TU TV TW TX TY TZ UA UB UC UD UE UF UG UH UI UJ UK UL UM UN UO UP UQ UR US UT UV UW UX UY UZ VA VB VC VD VE VF VG VH VI VJ VK VL VM VN VO VP VQ VR VS VT VU VW VX VY VZ WA WB WC WD WE WF WG WH WI WJ WK WL WM WN WO WP WQ WR WS WT WU WV WW WX WY WZ XA XB XC XD XE XF XG XH XI XJ XK XL XM XN XO XP XQ XR XS XT XU XV XW XX XY XZ YA YB YC YD YE YF YG YH YI YJ YK YL YM YN YO YP YQ YR YS YT YU YV YW YX YY YZ ZA ZB ZC ZD ZE ZF ZG ZH ZI ZJ ZK ZL ZM ZN ZO ZP ZQ ZR ZS ZT ZU ZV ZW ZX ZY ZZ																									
29 Transmission of detonation from gases to explosives. Yu. B. Khariton and E. V. Kdulovskaya. <i>Compt. rend. acad. sci. U. R. S. S.</i> 23, 630-1(1930)(in English). The explosive, MeNO_3 or nitroglycerin, was placed in a small cup at the bottom of a steel cylinder 1 m. long and 23 mm. in inside diam., which was filled with $2\text{H}_2 + \text{O}_2$ mixt. under pressure. When this mixt. was ignited electrically at the top of the cylinder, detonation occurred after the flame travelled about 40 cm. When gas pressure was 14 atm, MeNO_3 detonated. At pressures below 6 atm, nitroglycerin was unchanged, but at higher pressures up to 27 atm, it burned without detonation. C. G. Strom. Inst. Chem. Physics, Leningrad ASR-51A METALLURGICAL LITERATURE CLASSIFICATION																									

RDULTOVSKAYA, Ye. V., REYNOV, N. M., RODIONOV, S. F. and PAVLOVA, Ye. M.

"Selective Transparency of Atmospheric Aerosols." Iz. Ak. Nauk. SSSR, Ser.
Geog. i Geofiz. pp. 135-47, 1942

Translation 563849

U.S.S.R. Academy of Sciences
Radiation

May 49

"Measuring the Green-Radiation Line of the Nocturnal Sky Using a Photometer with a Secondary Electron Amplifier," G. P. Rodionov, Ye. N. Pavlova, Ye. V. Rudkovskaya, Sci Res Phys Inst, Leningrad State U imeni A. A. Zhdanov, 2 3/4 pp

"Dok Ak Nauk SSSR" Vol LXVI, No 1

Gives data on subject measuring, recommended for simplicity of operation, sensitivity, and precision for studying stationary type of radiation in upper atmospheric strata.

Submitted by Acad Terenin, 5 Mar 49

PA 50/49T95

MIKULASZEK, E.; POGONOWSKA-Goldhar, J.; RDULTOWSKA, H.; MULCZYK, M.

Immunochemical studies on *Shigella sonnei*, phase I and II, and forms R I - III. Pts. 1-3. *Bul Ac Pol biol* 11 no.2: 71-83 '63.

1. Department of Medical Microbiology, School of Medicine, Warsaw and Institute of Biochemistry and Biophysics, Polish Academy of Sciences, Warsaw. Presented by E. Mikulaszek.

RDULTOWSKI, Jacek, mgr inz.

Once more on the recovery of silver from used photofixer.
Rudy i metale 8 no. 5: 188 My '63.

POLAND/Chemical Technology. Chemical Products and Their Applications. Pesticides.

Abstr Jour: Ref Zhur-Khim., No 8, 1959, 28716.

Author : Graczyk-Tolwinska, Z., Szuchnik, A., and Edzianek, I.

Inst :

Title : Investigation of the Fungicidal Activity of Some Heterocyclic Compounds.

Orig Pub: Przegląd Dermatol i Wenerol, 8, No 3, 305-313 (1958)
(in Polish with English and Russian summaries)

Abstract: The authors have investigated the fungicidal activity of 1-(4'-methylthiazolyl-2')-, 1-(benzothiazolyl-2')-, 1-(α -naphthothiazolyl-2')-, and 1-(γ -pyridyl)-3,3,3-trichloro-2-propanols, β -(4-methylthiazolyl-2')-, β -(benzothiazolyl-2')-, β -(α -naphthothiazolyl-2')-, β -(γ -pyridyl)-

Card : 1/2

220

SEGAL, Pawel, prof. dr. med.; CHETKO, Edward; RDZANEK, Irena

Research on the role of corticosteroids in the pathogenesis of
mycotic corneal infections. Klin. oczna 35 no.2:337-342 '65.

1. Z Kliniki Chorob Oczu Akademii Medycznej w Lodzi
(Kierownika prof. dr. med. P. Segal).

RDZANEK, Irena

Classification of derpatophytes and dermatomycoses. Vest. dermat.
i ven. 36 no.10:42-44 0'62 (MIRA 16:11)

1. Iz dermatologicheskoy kliniki Meditsinskoy akademii
(zav. kafedroy - prof. S.Yablonskaya) v Varshave.

*

RDZANEK, Irena

Studies on the mechanism of action of griseofulvin. Przegl. dermatol.
49 no.5:437-444 '62.

1. Z Kliniki Dermatologicznej AM w Warszawie Kierownik: prof. dr
S. Jablonska.

(GRISEOFULVIN)

POHORECKA, Zofia; RDZANEK, Irena

Isolation from soil of apathogenic dermatophyte *Microsporum gypseum*. Przegl. dermat., Warsz. 47 no.3:185-194 My-Je '60.

1. Z Ośrodka Mikologicznego przy Klinice Dermatologicznej A.M. w Warszawie; Kierownik: prof. dr. S. Jablonska.

(SOIL microbiol.)

(MICROSPORUM)

RDZANEK, Irena; WEYMAN-RZUCIDLO, Danuta

Evaluation of the treatment with a new antifungal preparation Fongitex.
Przegl. dermat. 49 no.4:341-343 '62.

1. Z Kliniki Dermatologicznej AM w Warszawie Kierownik: prof. dr
S. Jablonska.

(FUNGICIDES)

RDZANEK, Irena; WEYMAN-RZUCIDLO, Danuta; POHORECKA, Zofia.

Infections caused by *Trichophyton quinckeanum* (murine favus).

Przegl. dermat. 50 no.6:533-538 N-D'63

1. Z Kliniki Dermatologicznej AM w Warszawie; kierownik:
prof.dr. S.Jablonska.

*

RDZANEK, Irena; WEYMAN-RZUCIDLO, Danuta; POHORECKA, Zofia

Laboratory determination of the fungistatic activity of sera from subjects treated with griseofulvin. Przegl. dermat. 49:205-208 '62.

1. Z Kliniki Dermatologicznej AM w Warszawie Kierownik: prof. dr S. Jablonska.

(GRISEOFULVIN)

WEYMAN-RZUCIDLO, Danuta; RDZANEK, Irena; POHORECKA, Zofia

Results of griseofulvin therapy of various forms of mycoses according to material of the Dermatological Clinic of the Academy of Medicine in Warsaw. Przegl. derm. 49:213-216 '62.

1. Z Kliniki Dermatologicznej AM w Warszawie Kierownik: prof. dr S. Jablonska.

(GRISEOFULVIN)

POHORECKA, Zofia; RDZANEK, Irena; WEYMAN-RZUCIDLO, Danuta

Determination of griseofulvin sensitivity in vitro among various strains of dermatophytes isolated from treated patients. Przegl. dermat. 49:201-204 '62.

1. Z Kliniki Dermatologicznej AM w Warszawie Kierownik: prof. dr S. Jablonska.

(GRISEOFULVIN) (DERMATOPHYTES) (DRUG RESISTANCE MICROBIAL)

RDZANEK, Irena; SZUCHNIK, Andrzej; GRACZYK-TOLWINSKA, Zofia

Studies on fungicides. Przegl. dermat., Warsz. 6 no.5:403-406
Sept-Oct 56.

1. Z Kliniki Dermatologicznej A.M. w Warszawie. Dyrektor Prof.
dr. S. Jablonska. Z Zakladu Chemii Organicznej U. W Kierownik:
prof. dr. W. Lampe. Z Instytutu Dermatologii i Wenerologii
p. o. Dyrektor: doc. dr. T. Stepniewski. Warszawa, Klinika
Dermatologiczna Akademii Medycznej, Koszykowa 82 a.

(FUNGICIDES, therapeutic use,
comparison of various prep. (Pol))

RDZANEK, Irena

Biomorphology of pathogenic fungi. Przegl.derm.,Warsz. 5 no.2:
157-166 Mar-Apr '55.

1. Z Kliniki Dermatologicznej A.M. w Warszawie. Dyrektor: prof.
dr. S.Jablonska.

(FUNGI,
pathogenic, biomorphol.)

GRACZYK-TOLWINSKA, Zofia; SZUCHNIK, Andrzej; ~~RDZANEK, Irena~~

Investigations on fungicidal activity of some drugs among heterocyclic derivatives. Przegl. dermat., Warsz. 8 no.3:306-313 May-June 58.

1. Z Instytutu Dermatologii i Wenerologii Dyrektor: doc. dr J. Suchanek
Z zakładu Chemii Organicznej U. W. Kierownik: prof. dr. J. Swiderski
Z Kliniki Dermatologicznej A. M. w Warszawie Kierownik: prof. dr S.
Jablonski. Adres: Warszawa, Instytut Dermatologii i Wenerologii, ul.
Koszykowa Nr 82-A.

(HETEROCYCLIC COMPOUNDS, eff.

fungicidal eff. (Pol))

(FUNGI, eff. of drugs on

fungicidal eff. of heterocyclic cpds. (Pol))

RDZANEK, Irena

Results of the treatment of mycoses by new fungicide drugs. Przegl.
derm., Warsz. 47 no.1:11-20 Ja-F '60.

1. Z Kliniki Dermatologicznej A.M. w Warszawie. Kierownik: prof.dr.
S. Jablonska.
(FUNGICIDES ther.)

RDZANEK, Irena; GRACZYK, Zofia

Studies on reversibility of pleomorphism in cultures of pathogenic fungi. Przegl.derm,Warsz. 5 no.2:136-142 Mar-Apr '55.

1. Z Kliniki Dermatologicznej A.M. w Warszawie. Dyrektor: prof. dr S.Jablonska i z Instytutu Dermatologii i Wenerologii.

Dyrektor: doc.dr J. Suchanek.

(FUNGI, culture
pleomorphic strains regression)

POLAND/Chemical Technology. Chemical Products and Their Applications. Pesticides.

II

Abs Jour: Ref Zhur-Khin., No 8, 1959, 28716.

Author : Graczyk-Tolwinska, Z., Szuchnik, A., and Rdzanek, I.

Inst :

Title : Investigation of the Fungicidal Activity of Some Heterocyclic Compounds.

Orig Lab: Przegląd Dermatol i Wenerol, 8, No 3, 305-313 (1958)
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Abstract: The authors have investigated the fungicidal activity of 1-(4'-methylthiazolyl-2')-, 1-(benzothiazolyl-2')-, 1-(α -naphthothiazolyl-2')-, and 1-(γ -pyridyl)-3,3,3-trichloro-2-propanols, β -(4-methylthiazolyl-2)-, β -(benzothiazolyl-2')-, β -(α -naphthothiazolyl)-, β -(λ - and γ -pyridyl)-

Card : 1/2

220

POLAND/Chemical Technology. Chemical Products and Their Applications. Testicides.

H

Abs Jour: Ref Zhur-Khin., No 8, 1959, 28716.

acrylic acid, β -(benzothiazolyl-2)-propionic acid, rhodanine, N-methyl- (I) and N-ethylrhodanine, N-methylrhodanyl-5-acetic acid and of its ethyl ester, and of the hydrochloride of 1-(α -pyridyl)-3,3,3-trichloro-2-propanol (II) on Trichophyton gypsum as-teroides, T. sulfurum, and Epidermophyton Kauffmann-Wolf. I and II showed the greatest activity. --
A. Grapov.

Card : 2/2

PIECHUCKI, Zbigniew; RDZANEK, Jerzy

General beta-radioactivity of some domestic food products of vegetable origin. Preliminary communication. Acta pol. pharm. 19 no.1:37-44 '61.

1. Z Wojskowego Instytutu Higieny i Epidemiologii w Warszawie.
(FOOD) (RADIOACTIVITY)

REA, V.

Experiences in mechanizing the loading of hay. p/ 522

SOTSIALISTLIK PÖLLUMAJANDUS. Tallinn, Estonia. Vol. 14, no. 11, June 1959

Monthly List of East European Accessions (EEAI), LC. Vol. 8, No. 9, September 1959
Uncl.

REAL, Jose.

Planning wrath of a people. Vsem.prof.dvizh. no.15:16-20 N '54.
(Honduras--Strikes and lockouts) (MLRA 8:1)

ACCESSION NR: AT4020798

S/2613 / 63/000/023/0097/0108

AUTHOR: Soovik, T. A.; Realo, E. Kh.

TITLE: Photoscintillations in crystals activated with mercury-like ions

SOURCE: An EstSSR. Institut fiziki i astronomii. Trudy*, no. 23, 1963.
Issledovaniya po lyuminestsentsii (Research in luminescence), 97-108

TOPIC TAGS: luminescence, photoluminescence, photoscintillation, phosphor crystalline phosphor, alkali halide luminescence, mercury-like activator, scintillation mechanism, alkali phosphate luminescence

ABSTRACT: Despite the fact that alkali halide crystals, activated with mercury-like ions, are among the most studied phosphors, data on the duration of intercenter luminescence is available only for certain of them; however, this information is necessary both for a correct explanation of the processes in the luminescence centers and for an understanding of the mechanism (of great practical importance) of the scintillation and ionic crystals under the effect of high-energy particles and quanta. In this article, a study was made of the decay time of photoscintillations (luminescence excited by short (10^{-7} sec) spark-light pulses) of certain alkali halide and phosphate phosphors, activated with mercury-like ions. A table is given which indicates that the decay times of the photoscintillation of these

Card 1/2

ACCESSION NR: AT4020798

phosphors are in good agreement with the view that there is a correspondence of the main emission band with $3p_1 \rightarrow 1s_0$ electron transitions in free activator ions. With the energy of the exciting quanta ranging from 4.1 to 5.7 electron volts, the photoscintillation decay time in KI-Tl is constant and equal to the mean life of the Tl center in state $3p$ ($\tau = 2.5 \cdot 10^{-7}$ sec at $T = 295K$). Comparison of the spectra of the quantum yield of photoscintillations and stationary luminescence in KI-Tl indicates that the fundamental component of Tl^+ center luminescence, excited in the longwave absorption band of the base substance, is low-inertial in character ($\tau < 10^{-6}$ sec). The photoscintillation quantum yield, excited in the longwave fundamental absorption band, is large enough to enable the energy transport, exciton mechanism to account for the mechanism of scintillation caused by the ionizing particles. "The authors wish to express their deep gratitude to Ch. B. Lushchik for suggesting the subject and for helpful discussion of the results and also to N. Ye. Lushchik, I. A. Muuga and S. G. Zazubovich for making available the phosphors." Orig. art. has: 2 figures and 1 table.

ASSOCIATION: Institut fiziki i astronomii AN EstSSR (Institute of Physics and Astronomy, AN EstSSR)

SUBMITTED: 19Jan63

DATE ACQ: 07Apr64

ENCL: 00

SUB CODE: PH

NO REF SOV: 017

OTHER: 008

Card 2/2

L 01456-66 EXT(1)/T IJP(c) CG/JXT(cz)

ACCESSION NR: AT5013694

UR/2613/64/000/030/0090/0092

AUTHOR: Soovik, T. A.; Realo, E. Kh. 44.55

TITLE: Photoscintillations in KI-In crystals 21.47.55

SOURCE: AN EstSSR. Institut fiziki i astronomii. Trudy, no. 30, 1964. Issledovaniya po lyuminestsentsii (Research on luminescence), 90-92 44.55

TOPIC TAGS: potassium compound, iodide, scintillation, photoluminescence, radioluminescence

ABSTRACT: This is a continuation of an earlier investigation (Trudy IFA AN ESSR No. 23, 97, 1963) of the exciton and of the electron-hole mechanism of photoluminescence and radioluminescence of KI-Tl crystals. The present research was prompted by the thought that KI-In crystals can yield more information on the energy transfer from the host substance to the luminescence centers, since the absorption bands connected with the indium centers are more clearly separated from the basic absorption, and the kinetics of the intra-center processes is practically independent of the temperature. The experiments were made on single crystals grown by the Stockbarger method (0.4 mol.% In in the melt), using a procedure close to that described in the earlier paper. A comparison of the excitation spectra of the stationary luminescence, photoscintillations and the damping time shows that the luminescence

Card 1/2

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ACCESSION NR: AT5013694

excited in the exciton band of absorption is almost equally short in duration as the luminescence occurring in direct excitation of the activator glow centers. Some discrepancies observed at low temperatures are briefly explained. At short wavelengths the photoscintillation yield in the region corresponding to interband transitions is practically zero, in spite of the growth in the yield of the stationary luminescence in this region. It is concluded that in the fundamental absorption band (up to 6 ev) the excitation of the photoscintillations is produced by exciton transfer of energy from the host substance to the indium glow centers, at least at the excitation intensities used (approximately 10^{12} quanta/cm²-sec). The electron-hole mechanisms causes more prolonged glow processes. Orig. art. has: 1 figure.

ASSOCIATION: none

SUBMITTED: 13Oct64

NR REF SOV: 005

ENCL: 00

OTHER: 000

SUB CODE: OP

Card 2/2

REBA, V.

Polishing lacquered objects by nitrogen paste. p. 336.

NARODNI SUMAR. (Drustvo sumarskih inzenjera i tehnicara Bosne i Hercegovine)
Sarajevo, Yugoslavia. Vol. 12, no. 4/6, Apr./June 1958.

Monthly List of East European Accessions (EEAI) LC Vol. 9, no. 2, Feb. 19~~60~~.

Uncl.

REBAC, A.

Some problems concerning the breeding of domestic animals in Bosnia
and Hercegovina. n. 32

POLJOPRIVREDNI PREGLAD. (Društvo poljoprivrednih inženjera i tehnicara
Bosne i Hercegovine) Sarajevo, Yugoslavia. Vol. 8, no. 1/2, Jan./Feb.
1959

Monthly List of East European Accession (EEA) LC, Vol. 8, no. 6
June 1959
Uncl.

POLAND

WIERSZYLLOWSKI J., REBANDEL Z., BABILAS W.
Department of Pomology at the College of Agriculture (Zaklad
Sadownictwa Wyzszej Szkoly Rolniczej), Poznan.

"Influence of 2,4,5-T and Gibrescol on the Shedding of Fruit
and yield of the Black Spaniard Sour Cherry".

Warsaw, Bulletin de l'Academie Polonaise des Sciences, Serie
des Sciences Biologiques Vol XI, No 4, 1963; pp 191-197.

Abstract [English article, Russian summary]: The authors re-
port on the results of experiments conducted over one year in
applying 2,4,5-T and gibrescol preparates to sour cherries.
Various concentrations were tested over varying periods of
time. It was found, that both preparates retarded the shedding
of fruits and increased the fertility of the Black Spaniard
cherry. The effectiveness of the preparates depends chiefly on
their concentration, period and frequency of application. While
2,4,5-T speeded up the ripening by 19 days, gibrescol delayed
it by 7 - 25 days; the fruits obtained were parthenocarpic,
their size was equal or smaller than that of the controlled
crops and they showed a favorable pip to fruit weight ratio.
Seventeen bibliographical references are listed: 4 Polish
and 13 English (USA, England).

1/1

ZALESKI, Karol; WIERSZYLLOWSKI, Jerzy; REBANDEL, Zofia; HOLUBOWICZ, Tadeusz

Control of apple scab (*Venturia inaequalis* Cke. Wint.) by
foliar spraying with urea and urea mixed with Bordeaux
mixture. Prace nauk roln i lesn 12 no.1:3-40 '62.

1. Chair of Pomology, Higher School of Agriculture, Poznan.

WIERSZYLLOWSKI, Jerzy; REBANDEL, Zofia; BABILAS, Walenty

Experiments in applying chemical substances as a control of
dropping plum sets. Prace nauk roln i lesn 12 no.1:41-46 '62.

1. Chair of Pomology, Higher School of Agriculture, Poznan.

WIERSZYLLOWSKI, Jerzy; REBANDEL, Zofia

Preliminary investigations on summer sprays of apricot and apple
trees with synthetic growth substances NAA and 2,4-D. Rocznik nauk roln
rosl 83 no. 4: 983-994 '61.

REBANDEL, Z.

'A Contribution to Research on the Separate and Mixed Planting of Apple and pear Seedlings in a Nursery." p. 129, (ROCZNIKI NAUK ROLINCZYCH. SERIA A-ROSLINNA, Vol. 66, no. 4, 1953, Warsaw, Poland).

SO: Monthly List of East European Accession, Library of Congress, Vol 2 no 10, Oct 1953, Uncl

REBANE, H.

Improvement cutting of young, spruce-hardwood stands under favorable growing conditions. p.572

SOTSIALISTLIK POLLUMAJANDUS. Tallinn, Estonia. Vol. 14, no. 12, June 1959

Monthly List of East European Accessions (EEAI), LC. Vol. 8, No. 9, September 1959
Uncl.

REBANE, J.

How our collective farm is increasing the production of meat. n. 454
SOTSIALISTLIK POOLUMAJANDUS. Tallinn, Estonia. Vol. 14, no. 10, May, 1959

Monthly List of East European Accessions (EEAI), LC. Vol. 8, No. 9, September 1959
Uncl.

TARMISTO, V., kand. geogr. nauk; Prinimali uchastiye: RENTER, R.;
VINT, E.; ELENURM, Kh. [Ellenurm, H.]; REBANE, I.; ANSEBERG, T.;
DAVIDOVA, T., red.; LIIVAND, T., tekhn. red.

[The Estonian S.S.R.]Estonskaia SSR. Tallinn, Estonskoe gos.
izd-vo, 1962. 635 p. (MIRA 15:11)
(Estonia)

REBANE, K.K.

REBANE, K.K.---"Electron States in a Nonordered Condensed Phase(Model in One Dimension)."
*(Dissertations For Degrees In Science And Engineering Defended At USSR
Higher Educational Institutions). (34). Leningrad Order of Lenin State
U imeni A.A. Zhdanov, Leningrad, 1955.

SO: Knizhnaya Letopis'. No. 34. 20 August 1955

* For the Degree of Candidate in Physicomathematical Sciences

REBANE, K.K.

Investigation of the influence of infrared light on phosphors of the zinc sulfide type. K. K. Rebane. *Trudy Inst. Fiz. i Astron. Akad. Nauk Estonsk. SSR*, 1956, No. 4, 81-107. The method of thermooptical glow curves (with pulsed uniform heating) by Lushchik (cf. preceding abstr.) was applied to $\text{SrS}, \text{CeS}, \text{Sm}$, by using illumination with light $> 900 \text{ m}\mu$. The brightness of the resulting flash remains const. to $\sim 333^\circ\text{K}$. and then drops to $1/2$ at 370°K . At this temp. there is a max. in the thermal glow curve as shown theoretically by L. The energy of the level, sensitive to infrared, E_i (energy of thermal ionization) $= 0.8 \text{ e.v.}$ and the ratio of optical and thermal ionization energy $= 1.5$. Measurements with ZnS, Cu are more difficult to make. The phosphor was heated to a certain temp., frozen in, and the light sum (after excitation with infrared) was measured, and this procedure was repeated after renewed excitation of the phosphor at a higher temp. The infrared wave lengths were $800 \text{ m}\mu$ and $\leq 1000 \text{ m}\mu$. The spectral sensitivity to infrared quenching of ZnS, Cu , $\text{ZnS}, \text{ZnO}, \text{Cu}$, $(\text{Zn}, \text{Cd})\text{S}, \text{Cu}$, $(\text{Zn}, \text{Cd})\text{S}, \text{Ag}$, and $\text{Zn}(\text{S}, \text{Se}), \text{Cu}$ (9.2, 13.6, and 19.5% ZnSe) was measured. The max. of all phosphors were at $800 \text{ m}\mu$ and $1200 \text{ m}\mu$. At liquid-air temp. only infrared of $1200 \text{ m}\mu$ can cause a light flash. The max. at $800 \text{ m}\mu$ corresponds to a peak in the glow curve at 335°K . and $E_i = 0.9-1.0 \text{ e.v.}$ The $1200 \text{ m}\mu$ peak corresponds to a max. at 336°K . and $\sim 0.7 \text{ e.v.}$ The ratio $E_i/E_r = 1.5$. The quenching coeff. with infrared was measured with the exciting light at 313, 305, 405, and 435 $\text{m}\mu$. The results show only a weak dependence on the wave length of the ultraviolet excitation. The dependence of the flash intensity of the intensity of the infrared radiation follows a power law with $n = 1.09-1.18$ for various $\text{ZnS}, \text{CdS}, \text{Cu}$ phosphors indicating some superlinearity. As a function of temp., the quenching coeff. has

REBANE, K. K.

the opposite trend with respect to the glow curve. The brightness of the phosphors is decreased mostly in the center of the emission band and in the green band more than in the blue band. The widths of the spectral bands are enlarged by thermal or thermooptical glow curves. The quenching coeff. μ is decreased with increasing CdS content; μ decreases with increasing activator concn. According to $\mu = A - B \log C$. A possible explanation of the mechanism is given, according to which the infrared radiation transfers electrons from traps to the cond. band and the free electrons can lose their energy to "quenching centers" in radiation-free transitions. Such centers can be Co^{++} , Ni^{++} , Fe^{++} , Mn^{++} , Pb^{++} , or Ti^{++} .

S. Pakswar

2/2

4/28

myc

REBANE, K. S. K.

Forbidden ranges of energy for an electron in a one-dimensional nonperiodic potential field.

P. 72, (Urimumed Trudy) No. 5, 1957, Tallinn, Estonia

SO: Monthly Index of East European Accessions (EEAI) Vol. 6, No. 11 November 1957

REBANE, K.

"A method of investigating deep trapping levels."

p. 126 (Murimused Trudy) No. 6, 1957
Tartu, Estonia

SC: Monthly Index of East European Accessions (EEAI) IC. Vol. 7, no. 4,
April 1958

48-4-27/48

Rebane, K. K.

SUBJECT: USSR/Luminescence

AUTHOR: Rebane K.K.

TITLE: Investigation of the Infra-Red Radiation Effect on the Luminescence of Phosphors of the Zinc Sulfide Type (Issledovaniye vliyaniya infrakrasnoy radiatsii na svecheniye fosforov tipa sul'fida tsinka)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 1957, Vol 21, # 4, pp 546-547 (USSR)

ABSTRACT: Curves of sensitivity to infra-red quenching and infra-red flash were measured for the following phosphors: ZnS-Cu(MgCl₂); ZnS, ZnO-Cu(NaCl); ZnS-Cu(NaCl); ZnS-Cu(KCl); ZnS-Cu, Co(NaCl); ZnS-Cu, Ni(NaCl) and ZnS-Cu, Fe(NaCl). It was found that the sensitivity of these phosphors to infra-red radiation has 2 maxima which are near 1,250 mμ, and 740 to 800 mμ. The position of sensitivity maxima to infra-red flash agrees well with the position of sensitivity maxima to infra-red quenching.

In the phosphors investigated, an infra-red flash was always observed in the beginning of the process of infra-red quenching.

Card 1/2

51-4-2-11/23

AUTHOR: Rebane, K. S. K.
TITLE: On Deep Capture Levels in ZnS Phosphors.
(O glubokikh urovnyakh zakhvata v fosforakh-ZnS.)
PERIODICAL: Optika i Spektroskopiya, 1958, Vol.IV, No.2, pp.211-216
(USSR).
ABSTRACT: Deep capture levels in ZnS phosphors activated with various impurities are studied. The phosphor ZnS-Cu(MgCl₂) which is very sensitive to optical flash excitation, has intense emission and bright thermoluminescence at about 100°C. The main method of these studies was that of "thermal stimulation of light-sums of luminescence rise" (Ref.12). This method is based on the dependence of the rise light-sum on earlier heating of the phosphor, which was excited before heating. The rise curves were obtained at room temperature. The author also studied the stimulating action of light. For this purpose he used the method of "optical stimulation of light-sums of luminescence rise" (Ref.9). The stimulating light was monochromatic. The stimulation was measured in terms of magnitude of the rise light-sum obtained after irradiation of a previously excited phosphor. Dependence of the

Card 1/4

51-4 -2-11/28

On Deep Capture Levels in ZnS Phosphors.

light-sum stored in the ZnS-Cu phosphor on the temperature employed for thermal stimulation is shown in Fig.1. A table on p.213 gives the rise light-sums produced by thermal stimulation of ZnS-Cu, ZnS-ZnO,Cu, ZnS-Cu,Fe and ZnS-Cu,Ni. This table shows that in the phosphors studied there are two groups of deep capture levels at about 110 and 190°C. The first group of levels, near 110°C, in phosphors ZnS-Cu(MgCl₂), ZnS-Cu(KCl), ZnS-Cu(NaCl) No.3 and ZnS-Cu(NaCl) No.4 appears also in their thermoluminescence, but it is absent in the thermoluminescence in the remaining phosphors studied. Thermoluminescence does not appear on freeing of charges from the 190°C levels. All ZnS phosphors have a maximum sensitivity to optical flash near 800 mμ. This maximum is due to freeing of electrons from the 110°C levels. From the results obtained the author concludes that deep levels in ZnS phosphors activated with copper are due to ZnS or to copper. Absence of thermoluminescence in these phosphors at temperatures corresponding to freeing of charges from capture levels may be due to: (1) freeing of holes only which recombine,

Card 2/4

51-4 -2-11/20

On Deep Capture Levels in ZnS Phosphors.

without radiation, with electrons at capture levels, (2) heating frees electrons from the capture levels, but thermoluminescence so produced does not appear because of the simultaneous process of temperature quenching. Fig.3 (curve 1) shows the stimulating action of light. The same figure (curve 2) shows also absorption by ZnS-Cu,Co. It is found that visible light possesses stimulating action down to 485 mμ. The most effective stimulating action is due to light with 2.2 eV energy (563 mμ). Comparison of the rise curve representing the stimulating action of light with the absorption curve shows that they are similar (Fig.3). Irradiation with light of 1.6 eV energy does not slow down luminescence rise in ZnS-Cu phosphor previously heated to 150°C. Irradiation with light of 2.2 eV energy decreases such rise considerably. It is pointed out that apart from the 110 and 190°C deep levels there should be at least one more group of deep levels in ZnS-Cu(MgCl₂). The author thanks Academician of the Estonian SSR, Professor F.D. Klement and also Ch.B. Lushchik for their advice. There are 3 figures, 1 table and 17 references

Card 3/4

51-4-2-11/28

On Deep Capture Levels in ZnS Phosphors.

of which 9 are Soviet, 6 English and American, 1 German and 1 Dutch.

ASSOCIATION: Institute of Physics and Astronomy, Academy of Sciences of the Estonian SSR. (Institut fiziki i astronomii AN ECSR.)

SUBMITTED: April 1, 1957.

1. Phosphors-Excitation
2. Phosphors-Luminescence-Temperature factors

Card 4/4

SOV/51-5-1-19/19

AUTHOR: Rebane, K.K.

TITLE: On the Relationship Between the Laws of Afterglow Decay and Fall of Photoconductivity (O svyazi mezhdu zakonami zatakhaniya poslesvecheniya i ubyvaniya fotoprovodimosti)

PERIODICAL: Optika i Spektroskopiya, 1956, Vol 5, Nr 1, pp 95-96 (USSR)

ABSTRACT: The author established (Ref 1) the relationship between the laws of afterglow decay and photoconductivity fall for Becquerel decay of afterglow. In this paper the relationship between these two laws in two more general cases is considered. In the first case the band system (Fig 1) is the same as in Ref 1: only electron conduction is present. Emission is produced on recombination of electrons at hole levels of only one type (A levels). In all other respects the spectrum of capture and recombination levels is quite arbitrary. In the second case (Fig 2) a more general band system is used: conduction is mixed, and the spectrum of capture and recombination levels is arbitrary. It is assumed that, as before, emission is due to recombination of conduction electrons with holes localized at levels of only one type (A levels). Possibility of localization of holes at various centres in the process of decay is taken into account

Cont 1/2

SOV/51-5-1-19/19
On the Relationship Between the Laws of Afterglow Decay and Fall of
Photoconductivity

as well as the possibility of electrons moving from the A levels to
the conduction band and holes moving to the hole band. There are
2 figures and 2 Soviet references.

ASSOCIATION: Institut fiziki i astronomii, AN ESR (Institute of Physics and
Astronomy, Academy of Sciences of the Estonian S.S.R.)

SUBMITTED: February 17, 1958

Card 2/2

1. Photoemission - Decay
2. Photoemission - Electrical factors
3. Photoconductivity - Analysis
4. Electron capture

SOV/51-5-3-14/21

AUTHOR: Rebane, K.K.

TITLE: On the Relaxational Processes in Crystal Phosphors with Complex Spectra of Capture Levels (O relaksatsionnykh protsessakh v kristallofosforakh so slozhnykh spektrami urovney zakhvata)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol 5, Nr 3, pp 307-311 (USSR)

ABSTRACT: Theoretical studies of the processes occurring in crystal phosphors with complex spectra of capture and recombination levels are made difficult by the rapid increase in the number of possible variants with increase in the complexity of the model used. The author obtains general results for certain classes of band models with arbitrary spectra of electron capture levels. Such a general model is applied to a phosphor whose afterglow decreases following Becquerel's law and the law of decay of photoconductivity is deduced. It is shown that the equality of the electron capture cross-section for all levels is an essential condition for decay under strictly equilibrium conditions when the ratios of the population numbers for any capture levels remain constant. In one particular case the system of equations

Card 1/2

SOV/51-5-8-14/21

On the Relational Processes in Crystal Phosphors with Complex Spectra of Capture Levels

which describes a general model with an arbitrary spectrum of electron capture levels can be solved exactly. The solution so obtained corresponds to afterglow decay along a second-order hyperbola. The paper is entirely theoretical and it is going to be published in greater detail in Transactions of the Institute of Physics and Astronomy of the Academy of Sciences of the Estonian SSR (Trudy Instituta fiziki i astronomii AN ESSR). The author thanks V.V. Antonov-Romanovskiy and Ch.B. Lushchik for advice and criticism. There are 9 references, 7 of which are Soviet.

ASSOCIATION: Institut fiziki i astronomii AN ESSR (Institute of Physics and Astronomy, Academy of Sciences of the Estonian S.S.R.)

SUBMITTED: November 14, 1957

and 2/2

1. Phosphor crystals--Theory
2. Phosphor crystals--Spectra
3. Electron capture phosphorescent decay--Theory

SOV/170-59-5-9/18

24(5)

AUTHORS: Rebane, K.K., Rentel', A.A., Sil'd, O.I.
 TITLE: On the Accuracy of Different Variants of the Franck-Condon Principle (O tochnosti razlichnykh variantov printsipa Franka-Kondona)
 PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1959, Nr 5, pp 60-69 (USSR)

ABSTRACT: The authors consider some problems in the application of the Franck-Condon principle, in particular the distribution of probabilities in electronic-vibrational transitions for vibrational levels with low quantum numbers. The main part of this investigation applies to a harmonic oscillator whose frequency does not change as a result of an electronic transition. In the first part of their paper the authors describe various methods of determining transitional probabilities, namely: the quantum-mechanical one and 3 forms of semi-classical treatment. In the quantum-mechanical treatment, the authors analyze existing formulae for probabilities of transition from the vibrational level of the n-number ground electronic state into that of the m-number excited electronic state. Using a Krivoglaz formulae [Ref 3] they calculate $W(n \rightarrow m)$ for $n = 0, 1$ and 2 for two values of the P_0 - quantity which characterizes Stokes'

Card 1/3

SOV/170-59-5-9/18

On the Accuracy of Different Variants of the Franck-Condon Principle

losses in the number of quanta. The results of calculations are presented in Figures 2 and 3 in the form of the curves in which the $W(m)$ -values are plotted versus m . In the semi-classical treatment, the authors, while retaining a part of the classical Franck-Condon principle formulation, modify another part of it by making allowance for the quantum-mechanical distribution of coordinate. They present 3 different forms of semi-classical treatment: B, B1 and B2. The latter two are based on the paper of Dexter [Ref 12]. The second part of the present investigation deals with the applicability of the semi-classical approximation of the B-type in more detail. This approximation is based on the statement that the quantum-mechanical distribution of coordinates goes over into the classical one with an increase of the number of vibrational levels. Analyzing this statement the authors found that a so-called "energy error" $\Delta \epsilon$ grows with an increase of the m -number as it is seen from the following relation:

$$|\Delta \epsilon| \approx m^{1/2} \hbar \omega$$

Card 2/3

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S/048/59/023/011/004/012
2019/B060

24.3600
AUTHOR:

also 2209

Rebane, K.-S. K. 21

TITLE:

Extinction of Luminescence of ZnS-Cu Phosphors by the
Infrared Light 4

PERIODICAL:

Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1959,
Vol. 23, No. 11, pp. 1296-1299

TEXT: By way of an introduction reference is made to investigations (Refs. 1-3) which had revealed that the quantum yield of luminescence in ZnS phosphors at very low excitation intensities E does not depend on the latter. Other authors, however, discovered a strong dependence of the quantum yield on E when illuminating the phosphors with infrared light. These effects had been investigated in a number of papers (Refs. 5-11). Other papers (Refs. 12 and 13) investigated the temperature-extinction of recombination luminescence and the mechanism of infrared extinction of luminescence in ZnS phosphors. The latter is explained by the circumstance that a freeing of holes is caused by the action of infrared light, and furthermore by the fact that in the case of sufficiently strong infra-

Card 1/4

85770

Extinction of Luminescence of ZnS-Cu
Phosphors by the Infrared Light

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B012/B060

red light intensity all holes are freed, which leads to a complete extinction of luminescence. Fig. 1a gives a synopsis of the measuring results obtained by the author in previous investigations (Refs. 10 and 11) concerning the dependence of the quantum yield on E under illumination of ZnS-Cu(NaCl) by strong infrared light. It may be observed therefrom that the quantum yield of luminescence, without infrared illumination, remains constant in a large E-range, and decreases only with very low E. When illuminating the phosphor by infrared light, the quantum yield remains constant with low E; still, it is much lower than it would be without illumination; with stronger excitation the quantum yield rises and approaches the non-illumination value. By a number of experiments luminescence was investigated under illumination, and two bands sensitive to infrared extinction appeared at room temperature. By the aid of an oscilloscope the author investigated the beginning and the extinction of luminescence, and found them to occur without any strong jump, which fact is characteristic of fluorescence. Moreover, the rules of temperature extinction in illuminated and non-illuminated phosphor were not in agreement with the quantum yield, whereas the luminescence spectrum is more or less in agreement in both cases. A few results are reported concerning the low level

Card 2/4

85770

S/048/59/023/011/004/012
B019/B060

Extinction of Luminescence of ZnS-Cu
Phosphors by the Infrared Light

captures; next, experiments are described, in which the dependence of the light sum on E under infrared illumination was investigated. Results are shown in the diagram of Fig. 1v. The possibility of freeing the carriers from levels corresponding to bands of longer wavelength than the fluorescent light, is known to apply to various luminescent systems. Above mentioned results allow the deduction that also the reverse phenomenon occurs. This is confirmed by the fluorescence spectrum of Fig. 2. The absence of an optical extinction by infrared illumination at the liquid air temperature points to the necessity of a prior thermal activation of the electrons. A comparison of the dependence of the quantum yield on E with the dependence of the light sum on E allows the assumption that in the case of a low E and under infrared illumination, these dependences are brought about by various processes. Results obtained here concern only one object in the large category of ZnS phosphors, and the construction of a usable hypothesis presupposes the investigation of further phosphors belonging to this category. Finally, the author thanks Ch. B. Lushchik for interest displayed in the present investigation and valuable remarks made during the interpretation of the results. Also a paper by Antonov-Romanovskiy is mentioned. There are 2 figures and 25 references:

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Card 3/4

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Extinction of Luminescence of ZnS-Cu
Phosphors by the Infrared Light

S/048/59/023/011/004/012
B019/B060

14 Soviet.

ASSOCIATION: Institut fiziki i astronomii Akademii nauk EstSSR
(Institute of Physics and Astronomy of the Academy of
Sciences, Estonskaya SSR)

Card 4/4

S/058/61/000/001/002/008
A001/A001

Translation from: Referativnyy zhurnal, Fizika, 1961, No. 1, p. 207, # 1G51

AUTHORS: Keyerberg, O., Rebane, K.

TITLE: A Method of Calculating Metallic Dielectric Coatings with Continuously Varying Optical Characteristics

PERIODICAL: "Uch. zap. Tartusk. un-ta", 1959, No. 74, pp. 75-84 (Eston. and English summaries)

TEXT: The authors present results of calculations, performed by K. K. Rebane's method (RZhFiz, 1959, No. 6, 14110), on some dielectric coatings with continuously varying refractive index. They plotted a graph of relation between the reflection coefficient (α) and the thickness of a treated layer (m) within which refractive index continuously increases. The analysis of the graph shows that no great decrease of α is obtained; the α -decrease is approximately the same at reflection of all waves for which m is larger than a quarter of the wavelength. The method is generalized to metallic dielectric coatings, and the calculation of the simplest single-layer metallic coating is presented as an illustration of the method. K. Rebane

Translator's note: This is the full translation of the original Russian abstract.
Card 1/1

KAAR, E.; KOLLIST, P.; LING, Kh. [Lin, H.]; MAAVARA, V.; MARGUS, M.;
NIL'SON, A. [Nilson, A.]; PARMASTO, E.; REBANE, Kh. [Rebane, H.];
SEPP, R.; VALK, U.; VEERMETS, K.; SKVORTSOVA, A., red.;
TOOMASALU, E., tekhn. red.

[Forestry research in the Estonian S.S.R.] Lesovodstvennye is-
ledovaniia v Estonskoi SSR. Tartu, 1960. 64 p. (MIRA 15:1)

1. Eesti NSV Teaduste akademia. Zooloogia ja botaanika instituut.
(Estonia--Forestry research)

9,4300 (1055, 1163, 1227, 1144)

S/023/²¹³¹²60/000/004/002/005
D221/D305

AUTHORS: Rebane, K.^K, Candidate of Physico-Mathematical Sciences,
and Sil'd, O.

TITLE: On the theory of electron-vibrational spectra of
molecules and crystals

PERIODICAL: Akademiya nauk Estonskoy SSR. Izvestiya. Seriya
fiziko-matematicheskikh i tekhnicheskikh nauk,
1960, no. 4, 313-330

TEXT: This paper describes some investigations of electron-vibra-
tional spectra with the method of moments previously used by M.
Lax (Ref. 1: J.Chem.Phys, 20, 1952, 1752). The authors claim that
this method does not suffer from the disadvantages of either the
single-coordinate models or the method of quasi-independent normal
vibrations. First, a simple derivation of equations for the moments
of spectral bands arising as a result of electron-vibrational tran-

Card 1/6

21312
S/023/60/000/004/002/005
D221/D305

On the theory of electron - ...

sitions is given. The moment S_1 of order C of the spectral band is given by

$$S_1 = \sum_i n_i \sum_s (E_s - E_i)^1 W_{si}. \quad (5)$$

The Franck-Condon factor $W_{si} = \left[\int \psi_{II}^*(x) M(x) \psi_{Ii}(x) dx \right]^2$; n_i is the number of systems in the initial vibrational level, number i ; E_i and E_s are the energies of the initial and final vibrational levels respectively; and $M(x)$ is the electron matrix element; $\psi_{Ii}(x)$ and $\psi_{II}s(x)$ are vibrational wave functions in electron states I (initial) and II (final); and x denotes an assembly of all vibrational coordinates; i and s are respectively the collective vibrational quantum numbers. This is transformed into the following relation in terms of the Hamiltonian operators $\hat{H}_I$ and $\hat{H}_{II}$

Card 2/6

21312

S/023/60/000/004/002/005
D221/D305

On the theory of electron- ...

$$S_i = \sum_l n_l \sum_{k=0}^l (-1)^k C_l^k \int dx \{ \psi_i^*(x) M^*(x) \hat{H}_l^{(-k)} M(x) \hat{H}_l^k \psi_i(x) \}. \quad (8)$$

whence the respective moments may be calculated. This formula has wide limits of applicability, since the adiabatic approximation is not required for its derivation, the vibrations are not described by normal coordinates, and the distribution of systems among the vibrational levels need not be in thermal equilibrium. The authors now proceed to consider the conditions for mirror symmetry of absorption and radiation bands in electron vibrational transitions, a problem which has already been studied by V.L. Levshin (Ref. 2: Fotoluminestsiya zhidkikh i tverdykh veshchestv (Photoluminescence of Liquid and Solid Media) GITTL, M.-L., 1951, 96). There have been doubts whether the Levshin conditions are the only ones, for which mirror symmetry occurs. The statement of mirror symmetry is expressed as a relation between the moments of the bands which is then written in terms of Eq. (5). The equalities satisfying

Card 3/6

21312
S/023/60/000/004/002/C05
D221/D305

On the theory of electron- ...

this relation are identical with the Levshin conditions. These conditions are examined, and expressed in the form: (i) for the system of the two adiabatic potentials, either a plane of symmetry or a center of symmetry in the dimension (x) must exist; (ii) the distribution function of vibrational levels must be the same in each state; and it is shown that these conditions, in addition to being sufficient, are also necessary for mirror symmetry. Next, the authors calculate the moments of the spectral bands of a harmonic oscillator, whose frequency changes during transitions, on the basis of Eq. (8). Having determined the first four moments of the absorption band, the same moments for the radiation band are derived by making the appropriate substitutions, and the moments for a system of independent harmonic oscillators are also presented. Finally, the relation between the contours of absorption and radiation bands for the case, in which the frequency of vibration changes during transitions, on the basis of Eq. (8). In this case, there is no mirror symmetry. Approximate equations are deduced for

Card 4/6

21312
S/023/60/000/004/002/005
D221/D305

On the theory of electron- ...

the ratios of the first three moments, which are estimated to be within the accuracy of experimental measurements, the general equation being

$$\frac{s_n^{\alpha}(\epsilon)}{s_n^I(\epsilon)} = (-1)^n \left(\frac{p^{\alpha}}{p^I} \right)^n.$$

The moments are taken relative to the electron transition energy ϵ , the superscripts α and I represent absorption and emission respectively, and p is the Stokes loss for the particular case. It is shown that this approximation may be used for multi-coordinate as well as simple models. There are 1 figure and 22 references: 19 Soviet-bloc and 3 non-Soviet-bloc. The references to the English language publications read as follows: M. Lax, J.Chem.Phys., 20, 1952, 1752; F.E. Williams, J. Phys.Chem. 57, 1953, 780; R. Kubo, Y. Toyozawa, Progr.Theor. Phys., 13, 1955, 160; G. Russel, C.

Card 5/6

21312

S/023/60/000/004/002/005
D221/D305

On the theory of electron-...

Klick, Phys. Rev., 101, 1956, 1473.

ASSOCIATION: Institut fiziki i astronomii, Akademii nauk Estonskoy
SSR (Institute of Physics and Astronomy, Academy of
Sciences of the Estonian SSR)

SUBMITTED: March 19, 1960

Card 6/6

S/181/60/002/02/13/033
B006/B067

AUTHOR: Rebane, K. K.

TITLE: Relationship Between Recombination Luminescence²¹ and Conductivity in the Non-isothermal Case

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 2, pp. 273-274

TEXT: The present article is a continuation of Ref. 1 where the author demonstrated that an exact and relatively simple connection between the law of afterglow extinction $I(t)$ and that of the conductivity decrease $\sigma(t)$ is obtained in the isothermal case from the basic equation of recombination luminescence, which is usually used in the theory of crystal phosphors. The aim of the present paper was to demonstrate that, if the experiments are conducted non-isothermally, an analogous connection can be found also between the time functions of the intensity of recombination luminescence and the conductivity. The connection between $I(T)$ and $\sigma(T)$ indicates a relationship between the thermoluminescence curve and the curve of thermally stimulated conductivity. As in Ref. 1, a band scheme is considered: The crystal is regarded as homogeneous with

Card 1/2

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Relationship Between Recombination Luminescence and Conductivity in the Non-isothermal Case S/181/60/002/02/13/033
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pure n-type conductivity; luminescence is assumed to occur in the recombination of electrons on hole levels of only one type. The capture and recombination levels in the remaining spectrum are assumed to be arbitrary. Because of the temperature dependence of the recombination coefficients, mobility, and quantum yield, the relation obtained here (2) is much more complicated than in the isothermal case. In conclusion, the advantages offered by this new formula (2) are discussed. A detailed treatment of the problems under consideration will be published in "Trudy Instituta fiziki i astronomii" of the AS ESSR (AS Estonskaya SSR). There is 1 Soviet reference.

ASSOCIATION: Tartuskiy gosudarstvennyy universitet (Tartu State University)

SUBMITTED: April 24, 1959

Card 2/2

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26869
S/081/61/000/013/001/028
B105/B201

24.4000

AUTHORS: Rebane K. K., Sil'd O. I.

TITLE: Description of the transition probability distribution by the method of moments

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 13, 1961, 9, abstract 13B53 (Tr. In-ta fiz. i astron. AN EstSSR, 1960, No. 12, 264 - 266)

TEXT: The following formula was obtained for the calculation of the moment S_1 of the order 1 of the transition probability distribution in the quantum

system:
$$S_1 = \sum_{p=Q}^1 (-1)^p \binom{1}{p} \int (\hat{P}\psi_n) * \hat{H}_{II}^{1-P} \hat{H}_{II}^P \psi_n d\tau \quad (\hat{P} - \text{operator of the}$$

perturbation causing the transition; $\hat{H}_I$ and $\hat{H}_{II}$ - Hamiltonians of the initial and final states; ψ_n - wave function of the initial state). The application of this formula in dipole approximation to an atom at $l=1$ leads to the sum rule of oscillator forces. At other values of l or with another Card 1/2

Description of the transition...

26869
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B105/B201

type of perturbation operator, new sum rules are obtained. In accordance with the adiabatic approximation to a crystal or a molecule, the formula yields the known result (Lax M. "J. Chem. Phys.", 1952, 20, 1752). In the case of a harmonic oscillator, the first moments fully characterize the transition probability distribution. The transition probabilities for a harmonic oscillator can be obtained without solving the Schrödinger equation.
[Abstracter's note: Complete translation.]

Card 2/2

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S/051/60/008/04/020/032
E201/E691

24.3500

AUTHORS: Rebane, K.S.K. and Sakarinen, E.

TITLE: The Effect of Temperature on Infrared Quenching

PERIODICAL: Optika i spektroskopiya, 1960, Vol 8, Nr 4, pp 545-549 (USSR)

ABSTRACT: Dependence of the infrared quenching of luminescence on temperature was studied using nine phosphors and two excitation wavelengths (365 and 313 mμ). The phosphors were: (1) ZnS-Cu(10^{-5})NaCl(2%); (2) ZnS-Cu(10^{-4})NaCl(2%); (3) ZnS-Cu(10^{-3})NaCl(2%); (4) ZnS-Cu(10^{-2})NaCl(2%); (5) ZnS-Cu(10^{-4})NaCl(2%); (6) ZnS-Cu(10^{-4})NaCl(2%); (7) ZnS-Cu(10^{-3})NaCl(2%); (8) ZnS-Cu(3×10^{-5})ZnO(3%)NaCl(2%); (9) ZnS-Cu(3×10^{-5})Fe(10^{-5})NaCl(5%) without oxygen; the amounts of Cu and Fe are given in g/g. Phosphors 1-7 were prepared by heating in air, while phosphors 8 and 9 were prepared in A.A. Bundel's laboratory. The phosphors in the form of powders were pressed into cavities in an electric furnace and were covered by quartz plates. The temperature dependences of the intensity of luminescence were obtained by slow heating of the phosphors until luminescence was quenched completely and on subsequent cooling to room temperature. To excite luminescence the authors used mercury-quartz lamps PRK-2 or PRK-7 with filters UFS-3 and SS-9 (for 365 mμ) or with filters UFS-2 and ZhS-3 (for 313 mμ). In all experiments the initial

Card 1/3

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E201/E691

The Effect of Temperature on Infrared Quenching

intensity of luminescence was made the same by a suitable selection of the intensity of excitation. A cinema projection lamp of 400 W power with a KS-19 filter was used as the source of infrared radiation. The temperature quenching of the green band only was investigated. The intensity of luminescence was recorded by means of a photomultiplier FGU-17. The infrared quenching was defined as $\mu = (I_0 - I)/I_0$, where I_0 and I are the intensities of luminescence before and after irradiation with infrared light. In the nine phosphors studied the authors observed a temperature quenching "hysteresis": on cooling the intensity of luminescence did not return to its original value but remained 2-3 times weaker and the temperature quenching curve obtained by cooling differed from that obtained by heating. On the other hand, the nature of the dependence $\mu(T)$ was independent of whether it was obtained by heating or by cooling. The temperature quenching curves and the corresponding $\mu(T)$ curves are shown, for heating only, in a figure on p 547. Three parts of the $\mu(T)$ curves could be distinguished: (1) below the temperature-quenching region the value of μ falls with increase of the absolute temperature T ; (2) in the temperature-quenching region μ rises with T ; (3) when temperature quenching becomes strong μ falls again

Card 2/3

69276

S/051/60/008/04/020/032
E201/E691

The Effect of Temperature on Infrared Quenching

with T. These three parts, can be seen most clearly in the case of the ZnS-Cu(10^{-5})NaCl(2%) phosphor (curves 2 and 2' in the figure on p 547). The observed non-monotonic variation of $\mu(T)$ is due to the specific nature of the capture level spectra of the phosphors and due to the simultaneous de-excitation produced by rising temperatures and infrared light. Acknowledgments are made to Ch.B. Lushchik for his advice. There are 1 table, 1 figure and 10 references, 7 of which are Soviet, 1 English, 1 Soviet and German and 1 Soviet, German and English. ix

SUBMITTED: July 8, 1959

Card 3/3

9.4300

S/051/60/009/004/020/034
E201/E191

AUTHORS: Rebane, K.K., and Sil'd, O.I.

TITLE: A Relationship Between Electronic—Vibrational
Absorption Bands and Luminescence

PERIODICAL: Optika i spektroskopiya, 1960, Vol 9, No 4, pp 521-523

TEXT: Levshin gave in 1951 a mirror-symmetry law for absorption and luminescence bands (Ref 1). The present note establishes a relationship similar to that of Levshin for a luminescence centre in a crystal or for a molecule, when vibrational frequencies are affected by electronic transitions. The paper is entirely theoretical. There are 1 figure and 7 references: 6 Soviet and 1 English.

SUBMITTED: March 30, 1960

Card 1/1

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S/051/60/009/005/001/019
E201/E191

AUTHOR: Rebane, K.K.

TITLE: A Theory of Electronic-Vibrational Transitions in
Systems with Many Vibrational Degrees of Freedom

PERIODICAL: Optika i spektroskopiya, 1960, Vol.9, No.5, pp 557-561

TEXT: Electronic-vibrational transitions in complex systems (molecules or crystals) are frequently treated by one-coordinate methods (Refs. 2-9). The one-coordinate approach is a crude approximation. A more precise approximation consists of regarding vibrational motion of a complex system as an assembly of quasi-independent normal vibrations, but the validity of this approach has been questioned (Ref. 5). In the present paper the author deals with electronic-vibrational transitions in a different manner. He gives a simple derivation of a formula for the moment of a spectral band representing an electronic-vibrational transition. The treatment is applicable both to crystals and molecules (diatomic and more complex). The results obtained are identical with those reported by Lax (Ref. 1). The derivation shows clearly that Lax's expressions are valid also when

Card 1/2

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A Theory of Electronic-Vibrational Transitions in Systems with
Many Vibrational Degrees of Freedom

vibrational motion of nuclei is not given by normal coordinates and when the distribution in vibrational levels is not an equilibrium one. The electronic-vibrational bands may, moreover, consist partly or completely of separate lines. The theory is illustrated on the effect of omnidirectional (e.g. hydrostatic) compression of crystal phosphors on the profiles of their spectral bands. The paper is entirely theoretical. Acknowledgements are made to B.I. Stepanov for his advice and to O.I. Sil'd for help in calculations and for advice. There are 16 references: 9 Soviet and 7 English.

SUBMITTED: February 15, 1960

Card 2/2

S/048/60/024/05/07/009
B006/B017

AUTHORS: Rebane, K. K., Sil'd, O. I.

TITLE: Computation of the Probabilities of Electron-vibrational Transitions for an Anharmonic Oscillator 45

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya, 1960, Vol. 24, No. 5, pp. 539-544

TEXT: The present article is a reproduction of a lecture delivered at the Eighth Conference on Luminescence (Minsk, October 19-24, 1959). It was written in continuation of a previous paper in which the authors calculated the probability distribution w_{nm} of electron-vibrational transitions with respect to the vibrational levels by the quantum-mechanical method, and in which they compared them with the results offered by three variants of semiclassical calculation methods. The results of this paper were taken as a basis, i.e., $w_{nm} = \left[I_{nm}(0) \right]^2$ was calculated for a

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Card 1/3

Computation of the Probabilities of Electron-
vibrational Transitions for an Anharmonic
Oscillator

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Morse oscillator. First, expression (5) is deduced for $I_{nm}^{(0)}$, and for the hypergeometric series $F(\alpha, \beta, \gamma, z)$ occurring in it recurrence formula (6) is given. From these formulas the following distribution W_{nm} is calculated: $n = 0 \rightarrow m = 0 \div 30$; $n = 1 \rightarrow m = 0 \div 35$ for $a = +\sqrt{15} x_0$ (absorption) and for $a = -\sqrt{15} x_0$ (emission): $n = 0 \rightarrow m = 0 \div 12$; $n = 1 \rightarrow m = 0 \div 14$. ($x_0 = \sqrt{\hbar/\mu\omega}$). The Morse oscillator has the parameters $D = D' = 83.25 \hbar\omega$ and $gx_0 = 1/\sqrt{2 \cdot 83.25}$. Results are shown in Figs. 1-3. Fig. 1 shows a Morse oscillator and the probability distribution $W(E)$ of electron-vibrational transitions from the vibrational level $n = 0$ for various types of transition for the case $a = \sqrt{15} x_0$; Fig. 2 shows $W(E)$ for transitions from the levels $n = 0, 1$ for $a > 9$ and gives a comparison of the quantum-mechanically and semiclassically calculated functions; Fig. 3 presents $W(E)$ in a continuous energy scale for transitions from

Card 2/3

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A058/A101

AUTHORS: Rebane, K. K., Sil'd, O. I., Khizhnyakov, V. V.

TITLE: Note concerning the description of transition probabilities by the moment method

PERIODICAL: Referativnyy zhurnal, Fizika, no. 4, 1962, 23, abstract 4A181
("Tr. In-ta fiz. i astron. AN EstSSR", 1961, no. 13, 112 - 114)

TEXT: The authors consider the application of the moment method for describing the distribution of transition probabilities from initial state i to all other states f (including $f = i$) of a quantum-mechanical system. Two methods for averaging moment operator $\hat{S}_1$ (of order 1) are considered. In the first method, averaging is effected on the basis of wave functions ψ_i of a fixed initial state of the system:

$$S_1^{(i)} = \int \psi_i^* \hat{S}_1 \psi_i d\tau;$$

in the second method, instead of the wave function a density matrix figures:

$$S_1 = \sum_i w_i \int \psi_i^* \hat{S}_1 \psi_i d\tau = \text{Sp}[\hat{S}_1 \hat{\rho}],$$

Card 1/2

Note concerning the...

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where ω_i is the probability of finding the system in state i , and $\hat{\rho} = \exp(-\hat{H}/kT) / \text{Sp}[\exp(\hat{H}/kT)]^{-1}$ is the density matrix (the case of thermal equilibrium). It is noted that incident to averaging by the first method it is possible to determine the distribution of transition probabilities without knowing the wave functions of finite states or the energy spectrum of the system, while incident to averaging by the second method it is not even necessary to know the initial wave functions; in virtue of the invariance of the matrix trace, the calculation can be carried out using any suitable system of orthonormalized functions.

[Abstracter's note: Complete translation]

Card 2/2

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ACCESSION NR: AP5007272

S/0023/64/000/003/0165/0176

AUTHOR: Rebane, K. (Corresponding member AN EstSSR); Sil'd, O.

TITLE: Theory on the width of a pure electron line and a Mosabauer line of a free molecule

SOURCE: AN EstSSR. Izvestiya. Seriya fiziko-matematicheskikh i tekhnicheskikh nauk, no. 3, 1964, 165-176

TOPIC TAGS: molecular spectroscopy, line width, line spectrum, line intensity, molecule

Abstract: In this paper the authors examine the effect of translating, rotating, and oscillatory motion on the width of a pure electron line and a Mosabauer line in the spectrum of a free molecule. It is shown that the line width associated with the translating and rotating motions increases with an increase in the mass m of the molecule. The line width resulting from the translating motion is proportional to $\sqrt{kT/m}$ (T is the absolute temperature) and to the energy of the absorbing or emitting quanta. The line width associated with the rotation is also proportional to $\sqrt{kT/M}$ and inversely proportional to the radius of gyration of the molecule. The line width in the spectrum of a sufficiently heavy molecule is therefore determined by the translating motion.

Card 1/2

L 27815-65

ACCESSION NR: AP5007272

The form of oscillation in the spectrum of a free molecule is similar to that of the center of luminescence in the crystal. Hence it may be concluded that the relative intensity of a pure electron or Mossbauer line decreases rapidly (exponentially) with an increase in Stokes-loss (or with an increase in the reaction energy).

The pure electron line (half width $<10^{-3}\text{cm}^{-1}$) can be observed under the following conditions: 1) sufficient energy to isolate the electron level, 2) small Stokes-loss, 3) sufficiently heavy molecule ($>10^3 m_H$, where m_H is the mass of the hydrogen atom). To observe the Mossbauer line (half width $<10^{-3}\text{cm}^{-1}$) an extremely heavy molecule ($>10^{10} m_H$) is necessary even for very weak γ -quanta. The author expresses his thanks to

V. V. Khizhnyakov for his helpful suggestions. Orig. art. has 19 formulas and 1 graph.

ASSOCIATION: Institut fiziki i astronomii Akademii nauk Estonskoy SSR (Institute of Physics and Astronomy, Estonian Academy of Sciences, SSR)

SUBMITTED: 05Feb64

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SUB CODE: OP, NP

NO REF SOV: 015

OTHER: 003

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Card 2/2

REBANE, K.; SIL'D, O. [Sild, O.]

Theory of the widths of the purely electron and Mössbauer lines
of a free molecule. Izv. AN Est. SSR. Ser. fiz.-mat. i tekhn. nauk
13 no.3:165-176 '64. (MIRA 17:11)

1. Institut fiziki i astronomii AN Estonskoy SSR. 2. Chlen-korres-
pondent AN Estonskoy SSR (for Rebane).

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D207/D301

24,3500

AUTHORS: Rebane, K. K., Purga, A. P., Sil'd, O. I., and Kizhnya-
kov, V. V.

TITLE: On the theory of electronic-vibrational transitions in
crystals and molecules. I. The method of moments

SOURCE: Akademiya nauk Estonskoy SSR. Institut fiziki i astrono-
mii. Trudy. No. 14, 1961. Issledovaniya po lyuminest-
sentsii, 31-47

TEXT: The authors consider emission and absorption of light by a
general quantum system. The general form of the formula of moments,
giving the distribution of transition probabilities, is derived
quite simply. In the case of a luminescence center in the adiabatic
approximation the general formula is shown to reduce to the well-
known equations of M. Lax (Ref. 1: J. Chem. Phys., 20, 1752 (1952)).
The authors consider three ways of applying the moment formula to
profiles of continuous electronic-vibrational spectra. Edgworth's
formula (given by Lax in Ref. 1) is used to show that the theore-

Card 1/2

On the theory of electronic-vibrational... S/613/61/000/014/002/019
D207/D301

tical band profile, found using first moments, agrees well with an experimentally determined luminescence band of KCl:Pb peaked at 3.6 eV. There are 1 figure and 15 references: 9 Soviet-bloc and 6 non-Soviet-bloc. The 4 most recent references to the English-language publications read as follows: M. Lax, J. Chem. Phys., 20, 1752 (1952); G. Russell and C. Klick, Phys. Rev., 101, 1473 (1956); J. P. Vinti, Phys. Rev., 41, 432 (1932); R. C. O'Rourke, Phys. Rev. 91, 265 (1953). ✓
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SUBMITTED: July 16, 1960

Card 2/2